



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/724,074	12/01/2003	Miwa Okumura	239200US2X	1746

22850 7590 03/22/2005

OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER

YUN, JURIE

ART UNIT PAPER NUMBER

2882

DATE MAILED: 03/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/724,074	Applicant(s) OKUMURA ET AL.	
	Examiner Jurie Yun	Art Unit 2882	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 December 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 12/1/03.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 1 is rejected under 35 U.S.C. 112, second paragraph. The limitation "configured to..." (line 11) does not convey positive structural limitations but rather is regarded as a statement of intended use. It is suggested that "configured to" be changed to "means for" in compliance with the statute. Also, "at least one reconstruction part configured to reconstruct image data based on data collected by the second scan" recites intended use and does not convey positive structural limitations.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 9-15, and 17-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dobbs et al. (USPN 5,550,886).
5. With respect to claims 1, 9-15, and 17-21, Dobbs et al. disclose an X-ray CT apparatus, comprising: at least one X-ray irradiation source (40) configured to irradiate X-rays to a volume of interest (30); at least one X-ray detector (50) including a plurality

Art Unit: 2882

of detection element segments configured to detect the X-rays penetrated through the volume of interest; at least one collimator (60) configured to create an opening (62) that is adjustable at least in a slice direction and a channel direction (column 7, lines 47+); at least one controller (190) configured to set the opening of the at least one collimator to a second opening size to irradiate a second scanning range corresponding to the portion of the volume data and configured to perform a second scan of the second scanning range.

Dobbs et al. do not specifically disclose at least one image processing part configured to generate volume data from the detected X-rays and to extract a portion of the volume data corresponding to the volume of interest, and at least one reconstruction part configured to reconstruct image data based on data collected by the second scan. However, this would be obvious in any computed tomography system. It would have been obvious to one of ordinary skill in the art at the time the invention was made to include at least one image processing part and at least one reconstruction part in the CT apparatus of Dobbs et al., to enable imaging.

With respect to claim 9, Dobbs et al. disclose the at least one collimator (60) comprises a plurality of movable collimator blades (Fig. 3, 196 & 200) configured to create the opening (62), and a plurality of auxiliary blades (198a) configured to create a slit corresponding to detection element segments other than detection element segments corresponding to the opening.

With respect to claim 10, the plurality of collimator blades (196 & 200) creates the opening (62) at a center part; the plurality of the auxiliary blades (198a) create the slit

Art Unit: 2882

on at least one side part while blocking a central portion of at least one of the X-rays.

This would occur when the two opposing blades (196) are closed, thereby only allowing X-rays to pass through the side parts.

With respect to claims 17-20, Dobbs et al. do not disclose the first opening is created such that the X-rays which pass through the first opening are irradiated to approximately 16 detection element segments, and the second opening is created such that the X-rays which pass through the second opening are irradiated to approximately 4 detection element segments, wherein a width of the plurality of detection element segments in the slice direction is approximately 0.5 mm. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to determine the number of detection element segments to irradiate, and to determine the width of the detection element segments in the slice direction, depending on the application.

6. Claims 2-8 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dobbs et al. (USPN 5,550,886) as applied to claims 1 and 11 above, and further in view of Andrews (USPN 6,778,636 B1).

7. With respect to claims 2, 3, and 6-8, Dobbs et al. do not disclose the at least one controller is configured to set the opening of the collimator to a first opening size that is wider than the second opening size and to perform a first scan, wherein the amount of the X-rays used on the first scan is lower than an amount of the X-rays used in the second scan. Andrews discloses this (column 2, lines 41+). It would have been

Art Unit: 2882

obvious to one of ordinary skill in the art at the time the invention was made to have the controller set the opening of the collimator to a first opening size that is wider than the second opening size and to perform a first scan, wherein the amount of the X-rays used on the first scan is lower than an amount of the X-rays used in the second scan, to minimize off-focal radiation, thereby insuring a high quality x-ray image, as taught by Andrews. Dobbs et al. and Andrews do not disclose the at least one reconstruction part compensates external data of the second scanning range with data collected by the first scan, wherein the external data is collected during the second scan, and wherein the external data is collected based on an X-ray detected by detection element segments other than detection element segments used in the second scan. But this would be obvious. It would have been obvious to one of ordinary skill in the art at the time the invention was made to compensate external data of the second scanning range with data collected by the first scan, to make use of all information from both scans collected. Otherwise, it would be a waste of time and X-ray dosage.

8. With respect to claims 4 and 5, Dobbs et al. and Andrews do not disclose the first scan includes a helical scan, the second scan includes a helical scan, and a helical pitch of the second scan is shorter than a helical pitch of the first scan. However, helical scanning is well known in the art, and it would have been obvious to one of ordinary skill in the art to apply the collimator controller to a helical scanning CT apparatus, as this would also benefit from the minimization of off-focal radiation. The helical pitch of the second scan would be inherently shorter than a helical pitch of the first scan, since the first scan is wider than the second scan. Likewise, it would be inherent that the number

Art Unit: 2882

of the plurality of detection element segments used in the second scan would be fewer than a number of the plurality of detection element segments used in the first scan, since the second scan is not as wide as the first scan.

9. With respect to claim 16, Dobbs et al. and Andrews do not disclose the image data reconstructed by the reconstruction part includes heart image data based on the X-rays that pass through the first opening; and peripheral image data around the heart image data based on the X-rays that pass through the second opening. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to do this so that the heart can be imaged with less off-focal radiation ensuring a better image. This is taught by Andrews (column 2, lines 41+).

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Gohn et al. (USPN 6,445,764 B2) and Nishiki (USPN 5,027,380) disclose adjustable collimators in CT systems.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Julie Yun whose telephone number is 571 272-2497. The examiner can normally be reached on Monday-Friday 8:30-5:00pm.

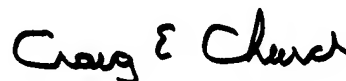
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on 571 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2882

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Jurie Yun
March 17, 2005



Craig E. Church
Primary Examiner